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**MEADS – A New Way of Doing International Development**



# MEADS – A New Way of Doing International Development

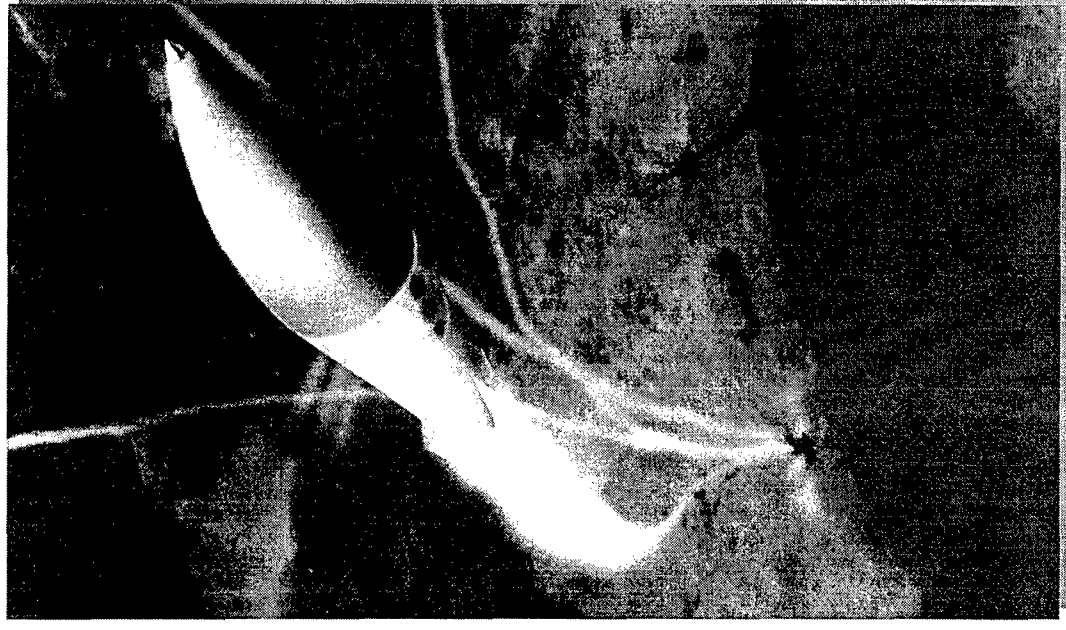
November 2002

World Class  
Air and Missile Defense  
for the 21<sup>st</sup> Century

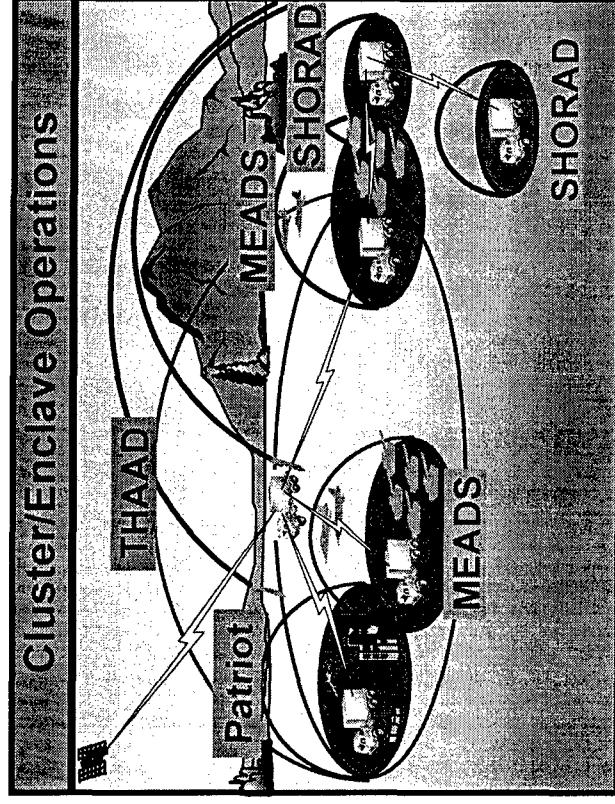
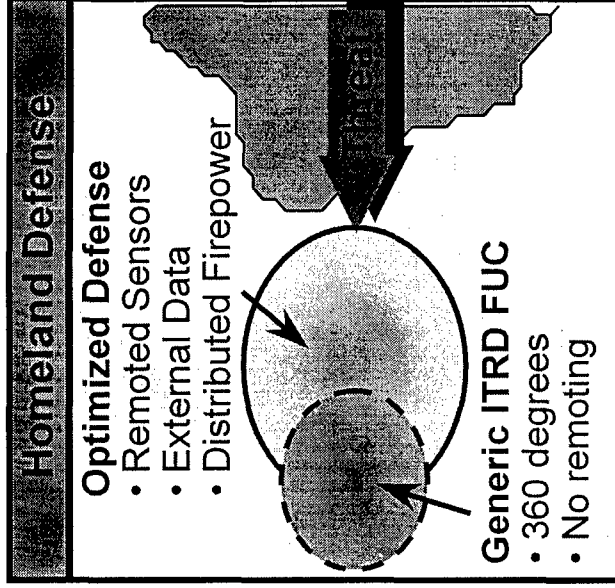
*Medium Extended Air Defense System*

# Outline

- Roles & Missions
- Performance Challenges
- Participating Companies & Countries
- Program History
- System Operation
- Radar Sensors
- Certified Missile Round (CMR)
- Simulations
- Current Status
- Summary



# Combat Operations Homeland/Cluster Defense



## *Tailored Defense Achieves Extended Coverage*

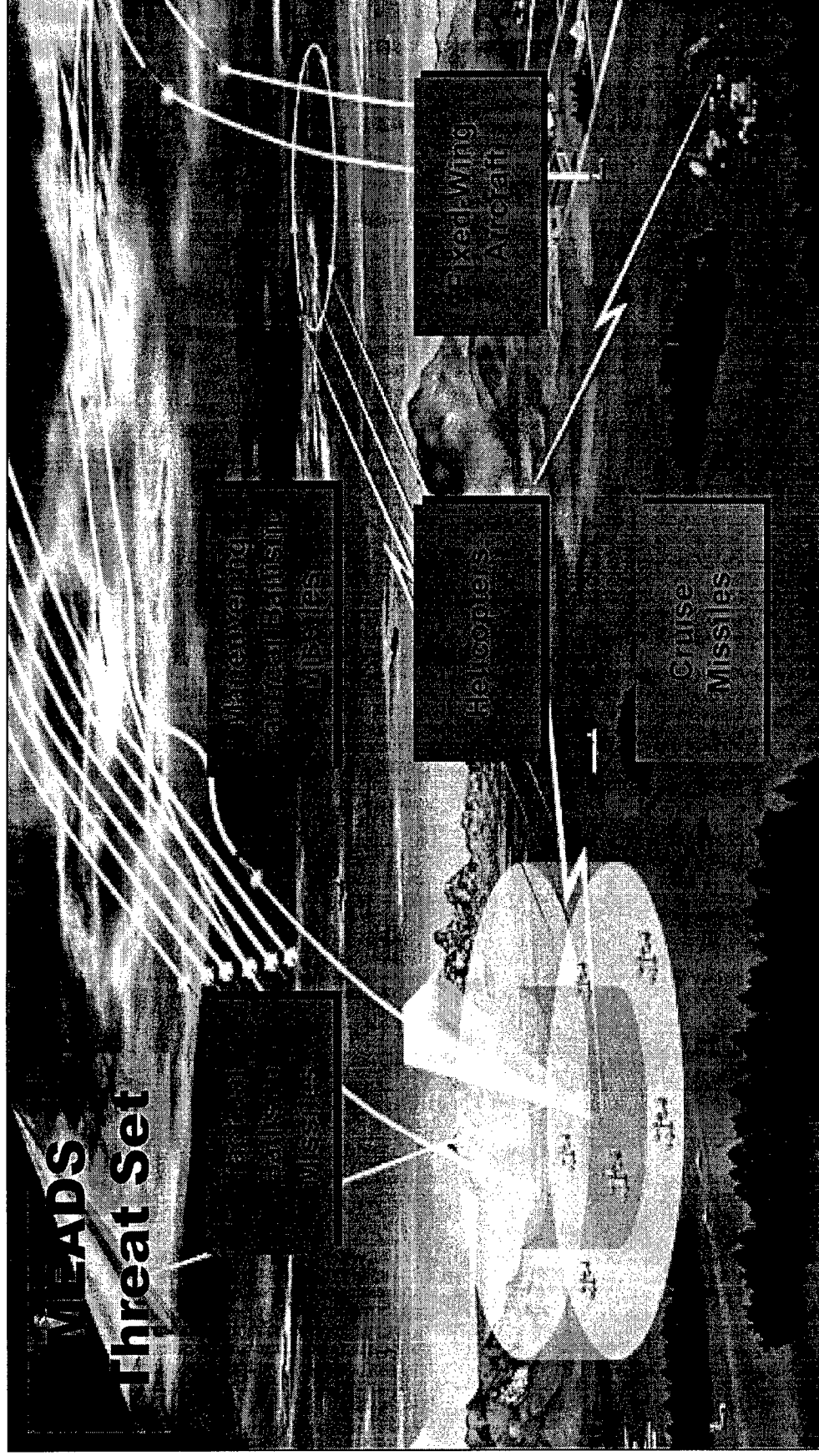
- A priori knowledge of threat attack azimuth
- MEADS integrated with other defense assets
- Integrated approach allows acceptable risk while extending coverage

## *MEADS BMC4I Enables Seamless Integration*

- FO planning capable of including complementary system contributions
- Common protocols, communications, and battle management rules facilitate operations

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# MEADS Performance Requirements

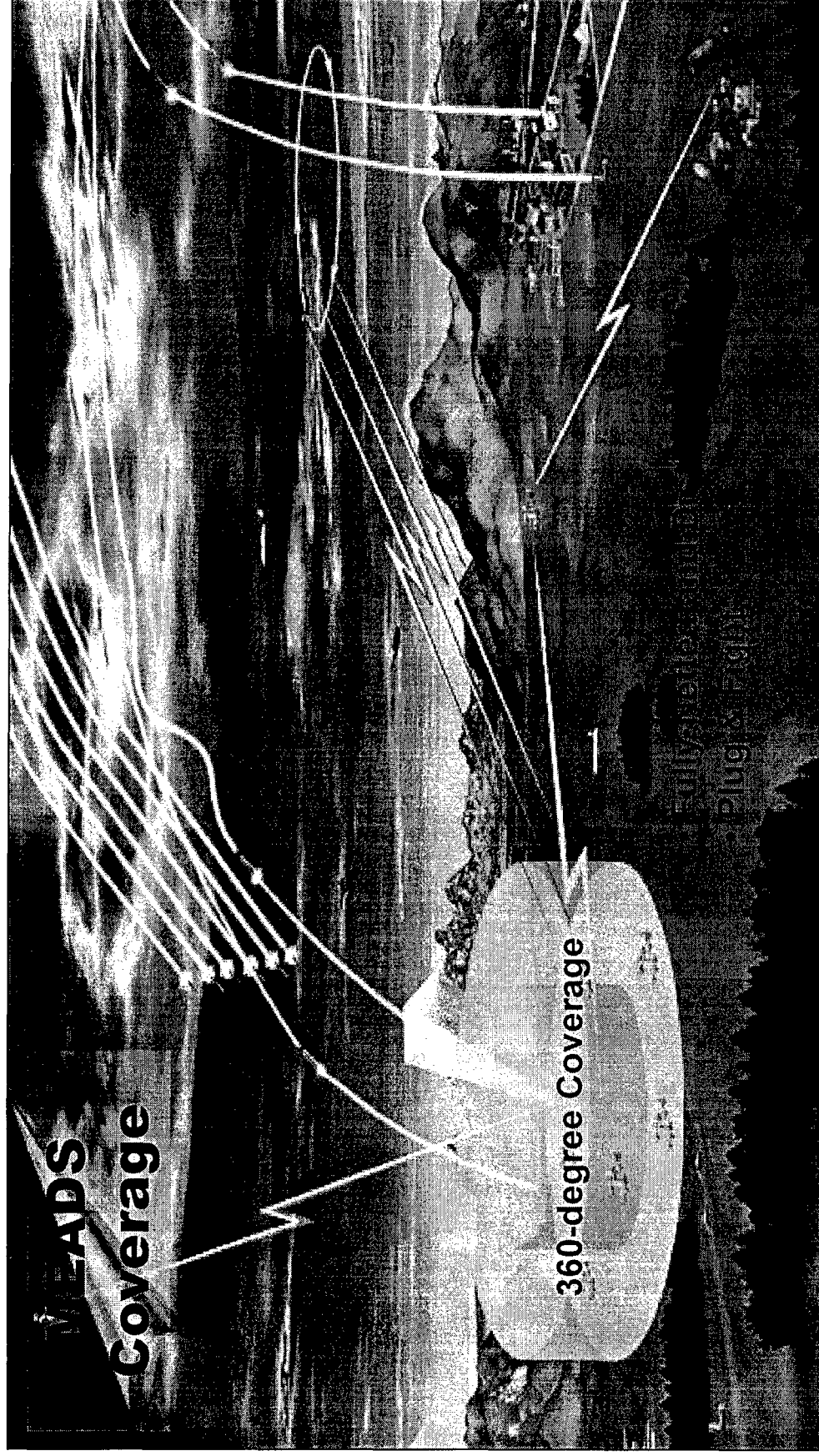


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# MEADS Performance Requirements



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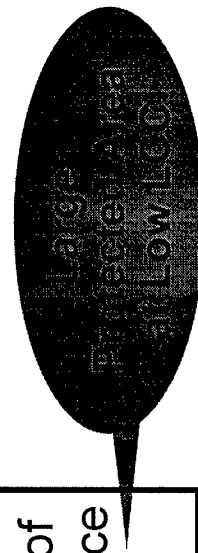
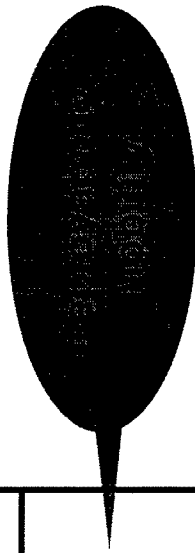
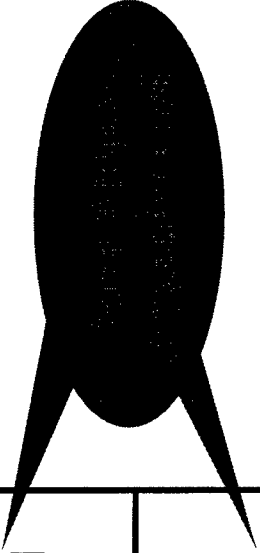
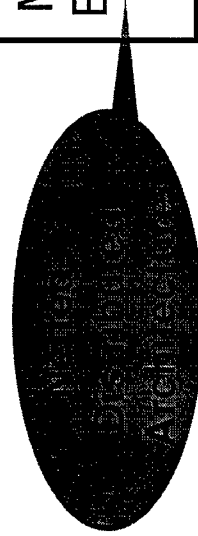
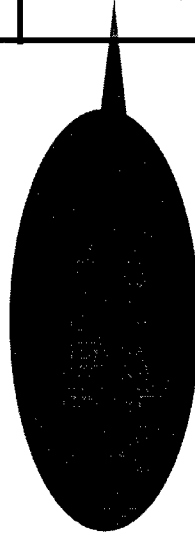
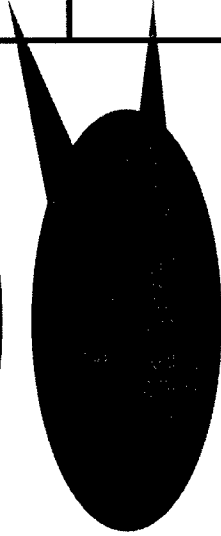
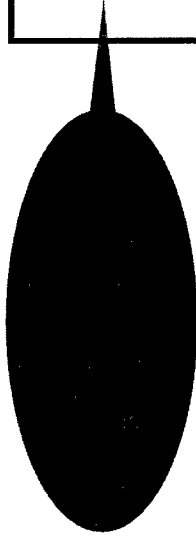
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# So Many Threats, So Little Time



Powerful Ground Sensors and Seeker	Autonomous Missiles and Flexible Ground Sensors
Fast Missile	High Fire Power Launchers
Accurate Seeker and Agile Missile	Weight/Size Limitations
Multiple Major End Items and Comm Net	Small Number of High Performance End-Items

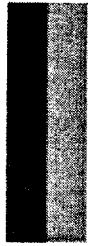


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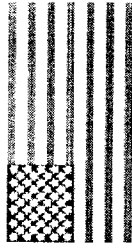


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# MEADS Program Structure



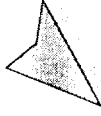
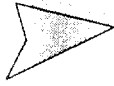
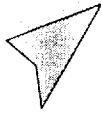
Germany



United States



Italy



## NAMEADSMA

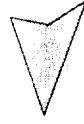
General Manager – General Franco Parisi (Italy)

Deputy General Manager – Chester Domaracki (US)

Lockheed  
Martin



MEADS  
International



euroMEADS

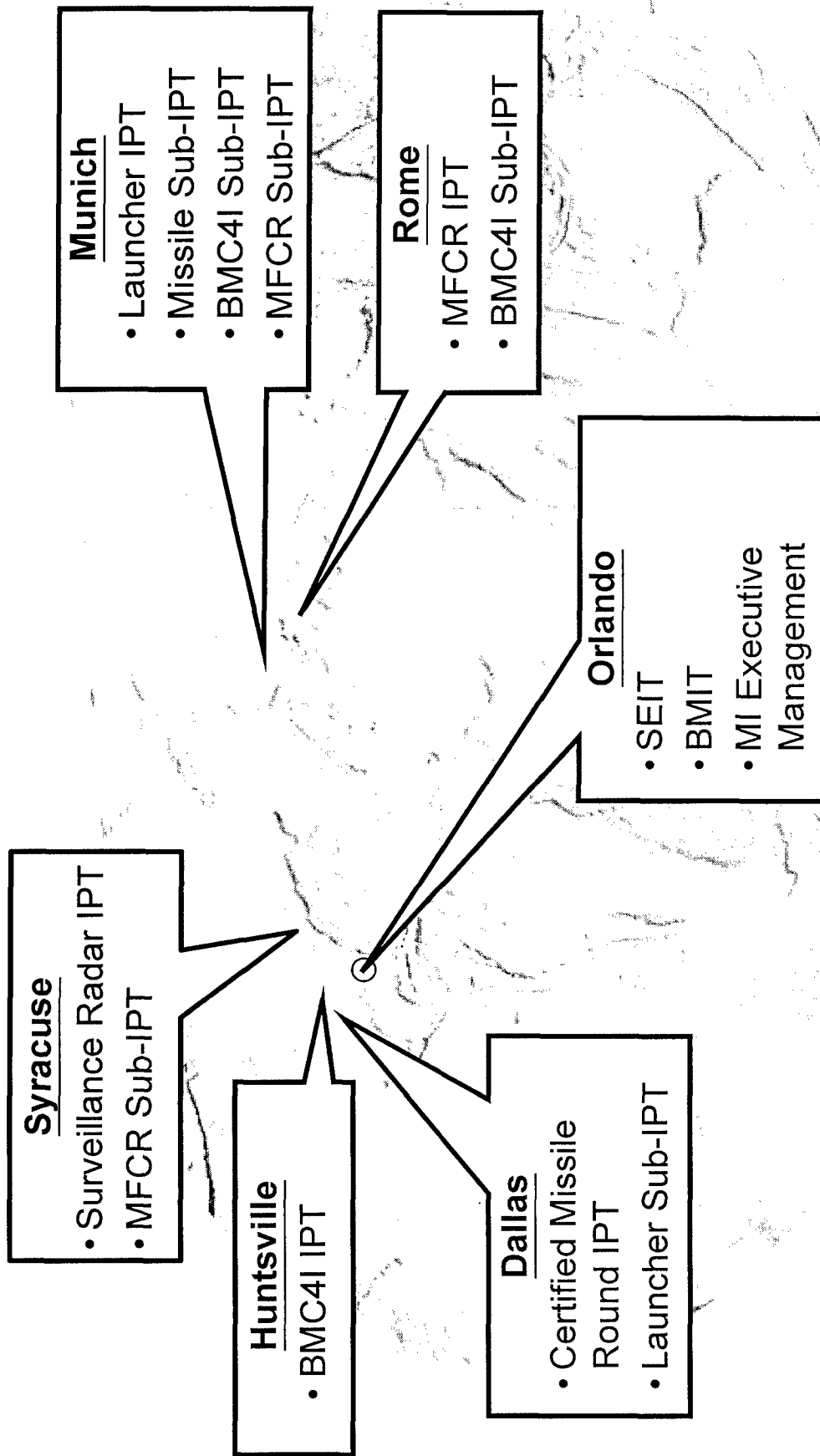
Formed by

- EADS
- EADS/ILFK
- MBDA Italia

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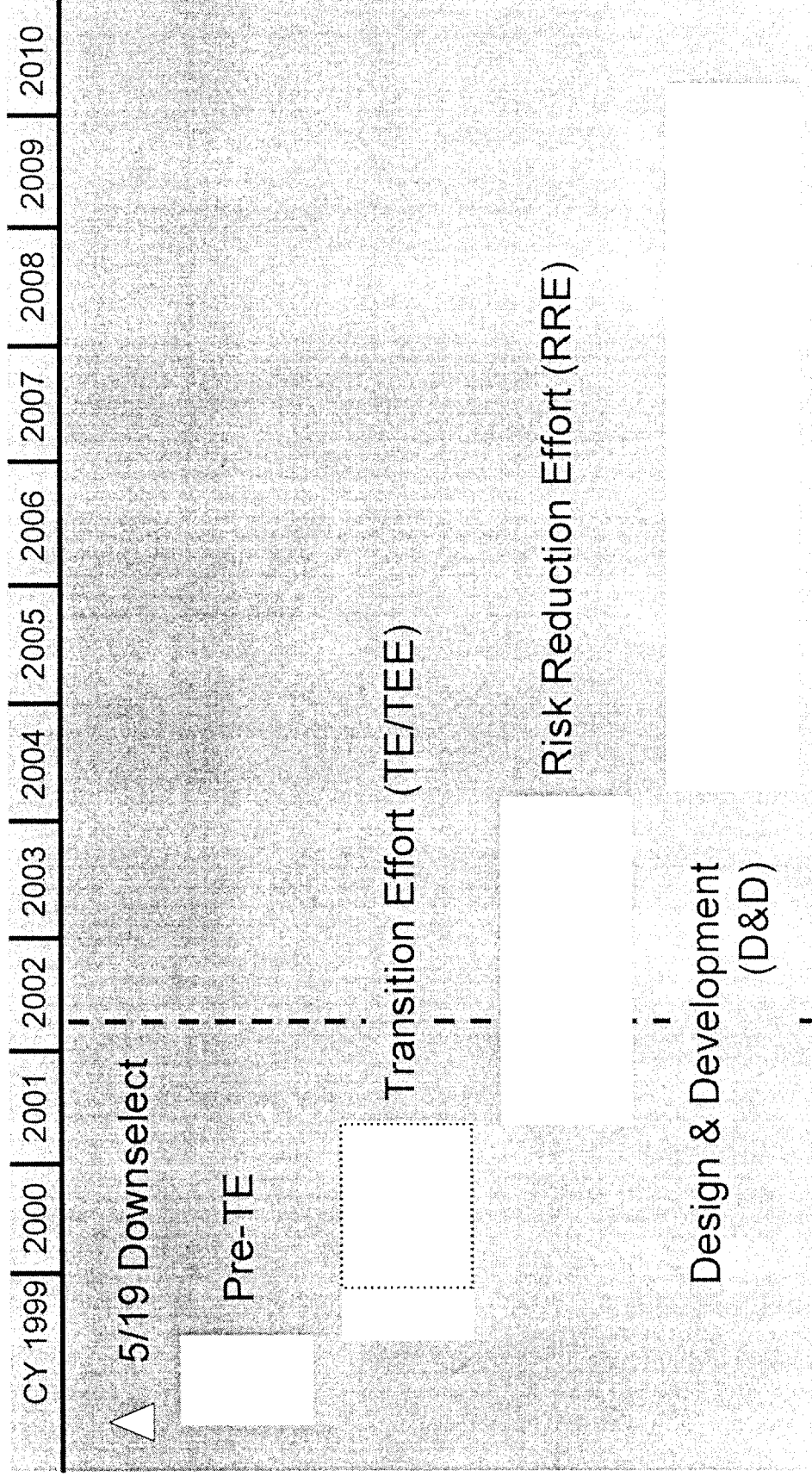
# MI International Cooperation



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# MEADS Program Plan (Notional)



*RRE provides key data for decision on full-scale development*

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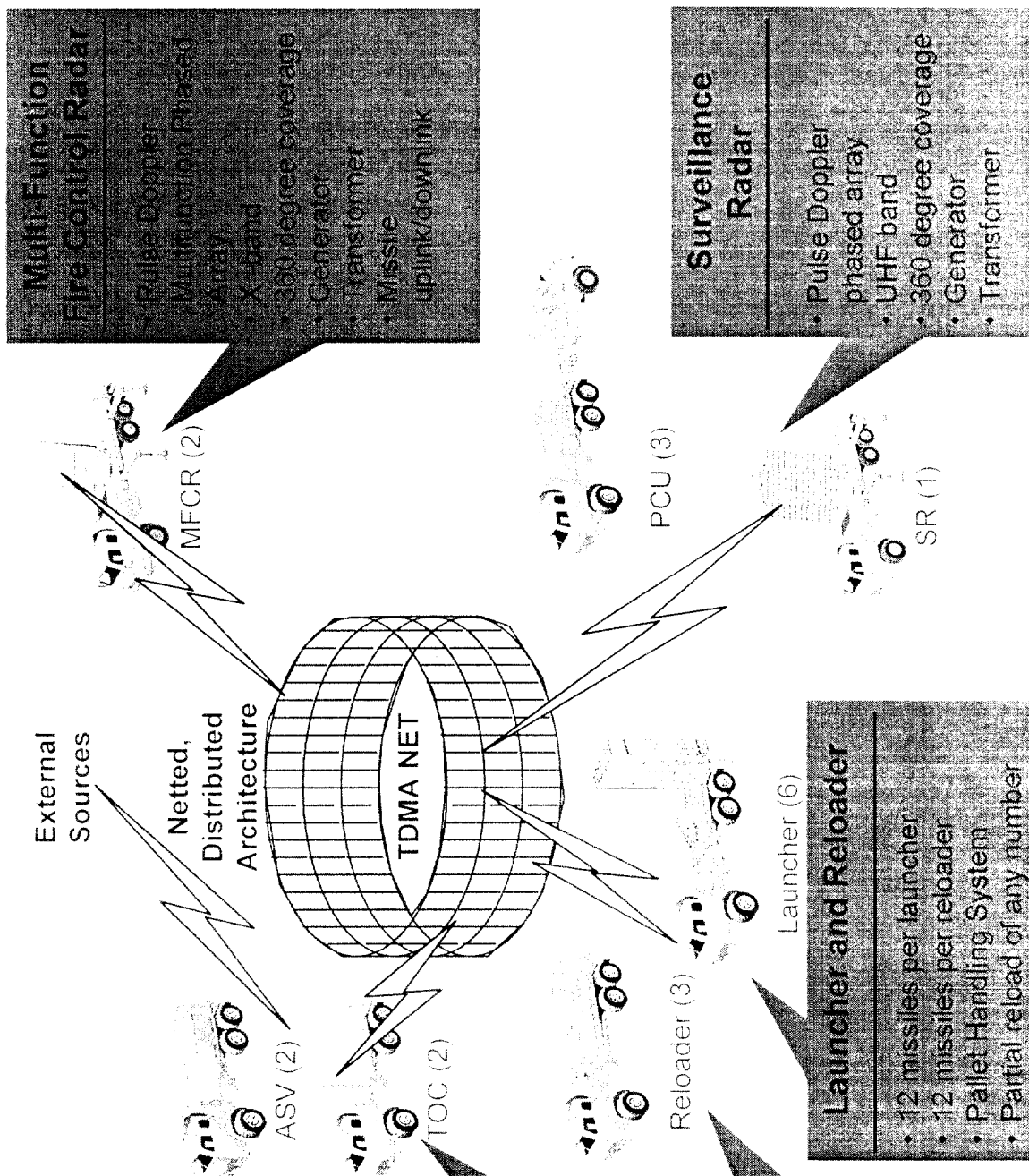
# MEADS System Concept



<b>Ref. Fire Unit</b> (Direct Maneuver Force Protection)
<ul style="list-style-type: none"> <li>• 1 SR</li> <li>• 2 MFCR</li> <li>• 2 TOC &amp; 2 ASV</li> <li>• 6 launchers</li> <li>• 3 reloaders</li> <li>• 108 missiles</li> <li>• 50 personnel including support</li> </ul>

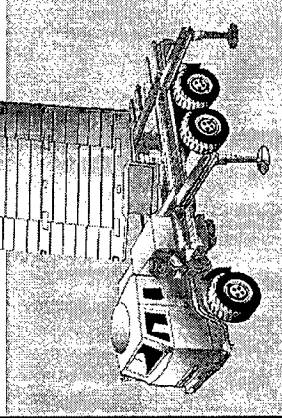
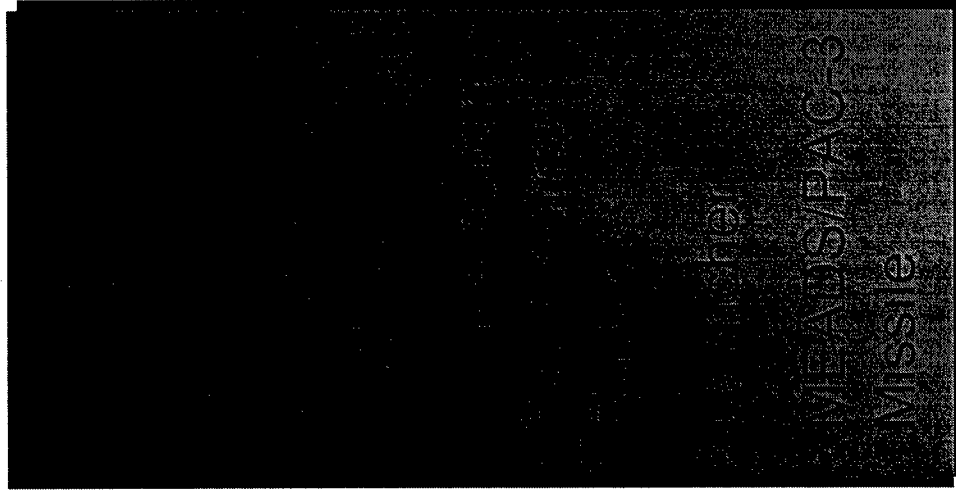
<b>BMG4U/TOC</b>
<ul style="list-style-type: none"> <li>• 2 TOC per Fire Unit</li> <li>• 2 ASV per Fire Unit</li> <li>• EO and EO functions</li> </ul>

<b>PAC-3 Missile</b>
<ul style="list-style-type: none"> <li>• Solid motor propulsion</li> <li>• Active RF seeker</li> <li>• Solid thrusters and rolling airframe for end-game agility</li> <li>• Hit-to-kill</li> </ul>



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# MEADS Physical Architecture



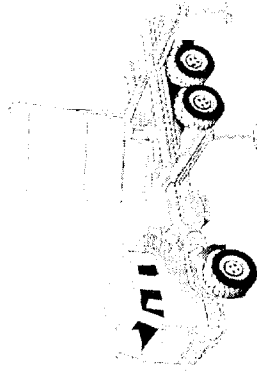
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# MEADS Physical Architecture



- Tactical Operations Center
- Surveillance Radar
- Multi-function Fire Control Radar
- Launcher
- MEADS/PAC-3 Missile



- X-band radar
- High-power 360-degree engagement capability
- Fixed 90-degree sector capability
- Surveillance and fire control capabilities for early entry scenarios
- Pulse-Doppler multi-function phased array with IFF
- ESM sensors

- *Nation-specific chassis*
- *C-130 roll-on/roll-off transportable*
- *2 per fire unit*

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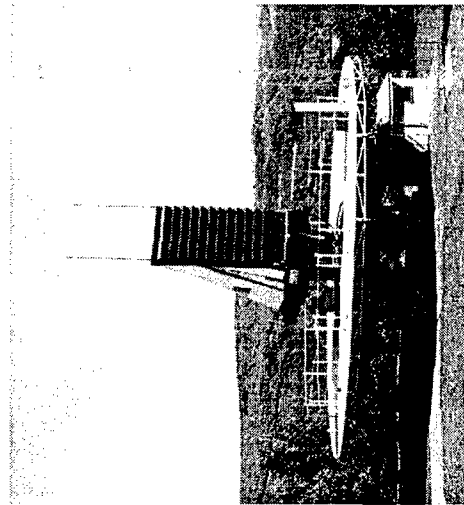
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# Sensor Risk Reduction

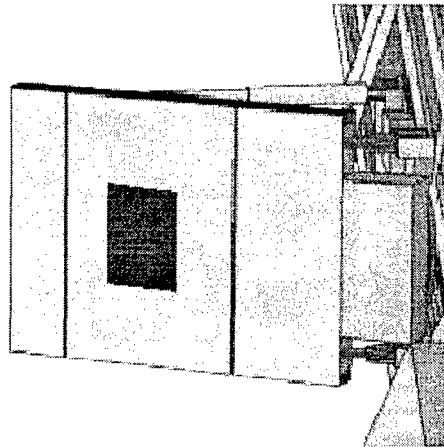


Project Definition/Validation

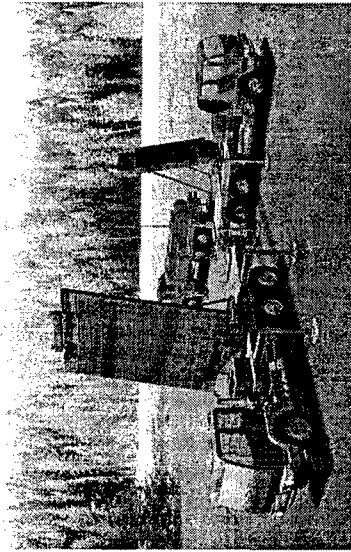
Risk Reduction Effort



UHF Digital Radar <sup>(1)</sup>



MFCR Prototype



MEADS Sensor Suite

(1) Developed on LMCO IR&D

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Per CO-32-10426-OL, 17 July 2001

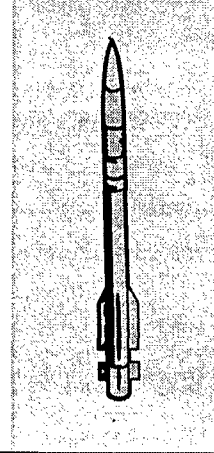
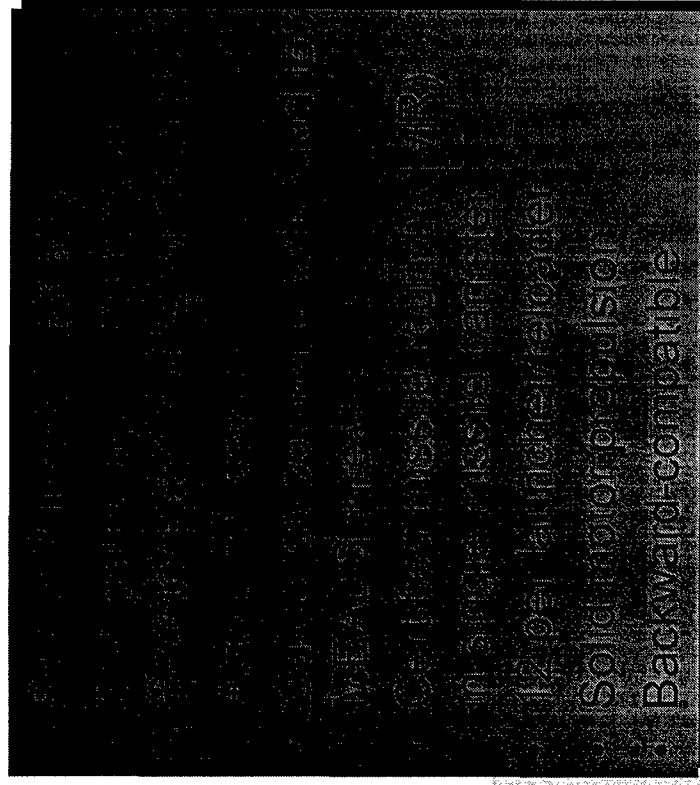
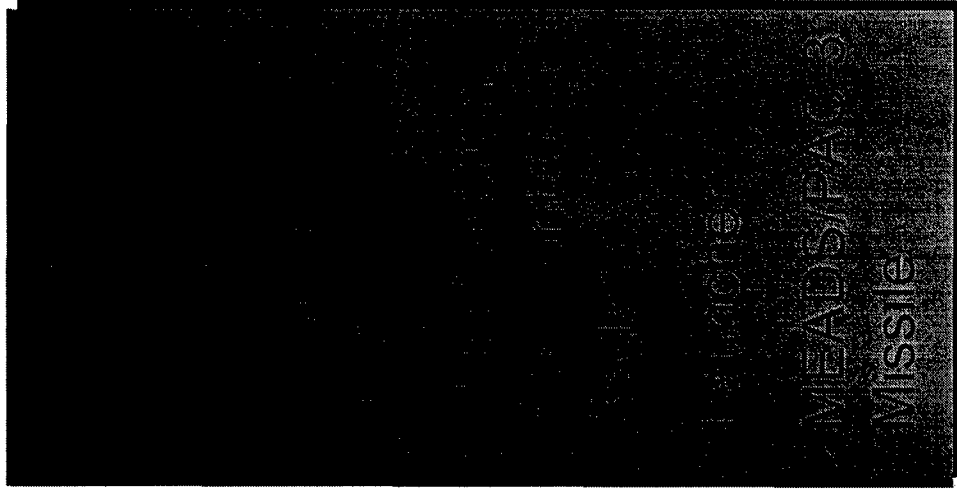
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# MEADS Physical Architecture



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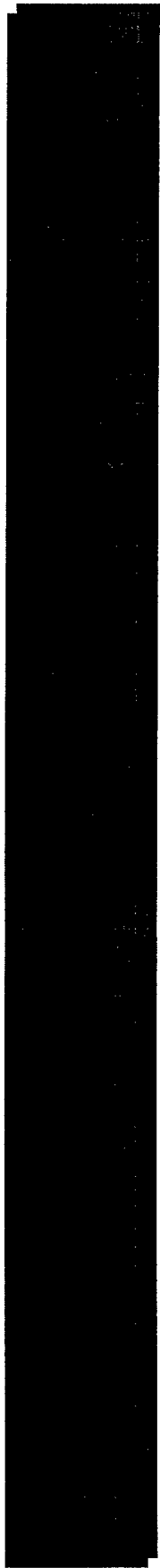


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# PAC-3 Missile Validation



- Successful flight test program
  - 2 *Control Test Flights* – DT-1 and DT-2
  - 5 *TBM Intercepts* – SCF, DT-3, DT-5, DT-6 and DT-8
  - 1 *Attack Aircraft Kill* – DT-9
- Low Rate Initial Production (LRIP) go-ahead December 1999
- Full Rate Production (FRP) September 2002
- Lockheed Martin Missiles and Fire Control is the only contractor with a legacy of successful endo-atmospheric hit-to-kill interceptor programs
- The PAC-3 missile defeats the entire Patriot threat set
  - Tactical ballistic missiles, advanced cruise missiles, and air-breathing threats



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# Model & Simulation Development



## Syracuse

- Radar (SR+MFCR) Model
- RADPERF

## Munich

- PDV One-on-One Mods for Upgrade Studies
- RRE One-on-One FSC Mods for BMC4I
- Launcher model Changes
- BMC4I Pilot Models

## Huntsville

- BMC4I Model

## Dallas

- PAC-3 Missile Segment Model
- RRE One-on-One
- Initial Launcher Model
- PEELS

## Orlando

- ETE and ETE/DEMO Mode
- PDV One-on-One
- RRE One-on-One (usage)
- EADSIM
- MTOS
- PEGEM/HEAT/PEELS

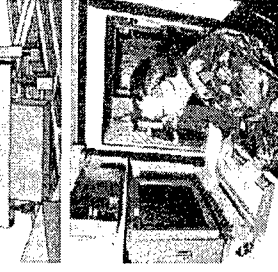
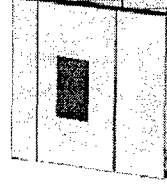
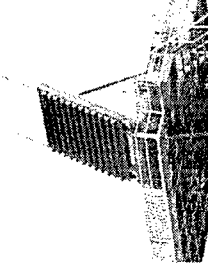
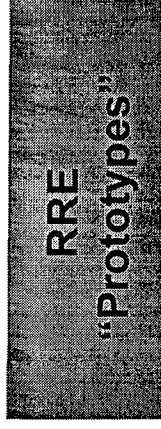
## Rome

- RRE 1-on-1 FSC Mods for Radar
- BMC4I Pilot Models

# Risk Reduction Effort Progress



- Incorporate and integrate PAC-3 missile into MEADS architecture
- Develop tailored fidelity system prototype
- Balance prototype hardware and software with simulation
- Develop RRE prototypes that are upgradeable to full fidelity Design & development (D&D) major end items (MEIs)
- Prove out system functionality in demonstrations
- Increase fidelity of program cost and schedule



**portability**  
**ability**

**at suite countered**

**cycle costs**

**ted flexibility**

**distributed BMC4I**

**ight capability**

**scalable battle elements**

inf

